5.15 OUTDOOR RECREATION

Water quality problems and control measures related to dispersed and developed recreation throughout the Lahontan Region are discussed in Chapter 4 of this Basin Plan. Impacts of recreation are of special concern in the Lake Tahoe Basin, which receives as many as 20 million visitors annually. TRPA's regional environmental threshold carrying capacity standards include policies directing TRPA, in development of its Regional Plan:

1. *"to preserve and enhance the high quality recreational experience, including preservation of high quality undeveloped shorezone and other natural areas"*

2. to *"consider provisions for additional access, where lawful and feasible, to the shorezone and high quality undeveloped areas for low density recreational uses,"* and

3. *"to establish and insure a fair share of the total Basin capacity for outdoor recreation is available to the general public."*

Implementation of the last policy includes consideration of the availability of regionally limited "infrastructure" such as domestic water supplies and wastewater treatment capacity. TRPA regulates recreational capacity (and evaluates infrastructure needs) through the concept of "people at one time" (PAOT); overnight and day use PAOT capacities are assigned for planning purposes to specific areas.

The Regional Board may issue waste discharge permits to developed recreation facilities and/or take appropriate enforcement action to address the impacts of new construction, stormwater discharges, and maintenance activities such as fertilizer and pesticides use. Some recreational facilities may be subject to stormwater NPDES permits.

Under the 208 Plan (TRPA 1988, Vol. I, pages 151-152), outdoor recreation facilities are subject to the same types of voluntary and mandatory requirements for retrofit of Best Management Practices for erosion and stormwater control as are other types of development. Recreational facilities and activities are also subject to TRPA's Ordinance Chapter 9 enforcement program.

Public outdoor recreation projects may be exempted from TRPA's restrictions on development of land capability Class 1, 2, and 3 and SEZ lands, and from the Regional Board's discharge prohibitions related to land capability and SEZs if specific findings regarding necessity, lack of reasonable alternatives, and mitigation can be made. The exemption criteria are set forth in the section of this Chapter on development restrictions. Exemptions are granted only for public outdoor recreation projects which "by their very nature" must be sited on sensitive lands; Table 5.7-3 provides specific guidance to be used in making this finding.

Land coverage for recreational projects outside of community plan areas is limited to the Bailey land capability coefficients, without the availability of excess coverage by transfer. Within community plan areas, recreation projects may be allowed 50 percent land coverage by transfer (see the discussions of land capability and coverage elsewhere in this Chapter). The 208 Plan provides that existing recreation facilities in environmentally sensitive areas shall be encouraged, through incentives, to relocate to higher capability lands, except for those facilities that are slope dependent, such as downhill skiing.

Campgrounds and Day Use Areas

The potential exists for construction and expansion of campground and day use facilities on both public and private lands in the Tahoe Basin. TRPA's Regional Plan (TRPA 1987) includes density limits for campsite spaces; the Plan Area Statements identify areas where new campground and day use facilities are permissible.

Construction of new campgrounds should be subject to the same restrictions as apply to other development in the Tahoe Basin, including:

- Development shall not be permitted on high erosion hazard lands or in Stream Environment Zones, unless required exemption findings can be made.

- Coverage shall conform to the land capability system, unless required exemption findings can be made.

- Drainage, infiltration and sediment control facilities must be installed wherever water is concentrated

by compacted or impervious surfaces.

- Best Management Practices for construction sites and temporary runoff management must be followed.

The 208 Plan (TRPA 1988, Volume I, Table 16, reproduced as Table 5.7-3 of this Basin Plan) states that the following facilities and activities associated with campgrounds need not "by their very nature" be located within SEZs or on class 1b lands:

"Facilities and activities such as campsites, toilets, parking areas, maintenance facilities, offices, lodges, and entrance booths, except for facilities such as pedestrian and vehicular stream crossings, utilities, and erosion control facilities."

Table 5.7-3 includes similar provisions for campgrounds on land capability classes 1a, 1c, 2 and 3, except for the reference to stream crossings. These provisions effectively preclude the adoption of exemption findings for the facilities specified in connection with any campground project requiring a TRPA or Regional Board permit.

The 208 Plan (TRPA 1988, Vol. I, page 151) also states that new campground facilities shall be located in areas of suitable land capability and in proximity to the necessary infrastructures, and that development of day use facilities shall be encouraged in or near established urban areas, wherever practical.

Dirt roads in developed campgrounds should be surfaced or closed and revegetated. Other control measures may be required at specific sites including stabilization of cut and fill slopes; installation of drainage, infiltration and sediment control facilities; and modification or relocation of facilities in stream environment zones to minimize surface disturbance and interference with natural drainage. The measures required will depend on the specific characteristics of the campground site.

The Regional Board should continue to issue and enforce waste discharge permits for the construction, remodeling, and expansion of campgrounds and day use areas in the Tahoe Basin. The need for retrofit of BMPs, especially for facilities in SEZs, shorezone areas, and near tributary lakes and streams, should be evaluated, and WDRs can be used to require retrofit where necessary. Campgrounds and day use projects which involve one-time or cumulative soil disturbance of five acres or more will be subject to construction stormwater NPDES permits. Campground and day use facilities which accommodate large numbers of recreational vehicles should have properly designed and operated wastewater dumping stations, to discourage illegal dumping. (See the section of this Chapter on wastewater treatment, export, and disposal for a discussion of the requirement to export sewage from the Lake Tahoe Basin.) The Nevada Division of Environmental Protection should ensure that similar controls are enforced in Nevada.

Local or regional ordinances adopted to require surfacing or revegetation of private driveways or forest roads should also apply to dirt roads in campgrounds. Other control measures for existing campgrounds would require review of existing sites.

Construction of a developed campground on private land in the Lake Tahoe Basin requires permits from the city or county where the campground is built, and from TRPA. Permits for private campgrounds should prohibit development in SEZs or in excess of land capability, and should enforce the BMPs needed to prevent water pollution. Local governments in the Tahoe Basin should consider control of stormwater discharges from existing and potential private campgrounds and day use sites as part of their planning activities under their municipal stormwater NPDES permits.

Ski Areas

Water quality problems and control measures associated with ski areas are discussed in a regionwide context in Chapter 4 of this Basin Plan. Special provisions apply to ski areas in the Lake Tahoe Basin. TRPA's regional land use plan limits the potential for new or expanded ski areas by limiting the total allowable recreational capacity in "people at one time" (PAOT) through the year 2007. The 208 Plan does not include specific BMPs for ski areas. However, like other types of development in the Lake Tahoe Basin, ski areas are required to implement BMPs for new construction and to "retrofit" BMPs for existing development. TRPA requires preparation of a master plan before a ski area can be expanded. Once approved by TRPA, the master plan becomes part of that agency's regional land use plan.

TRPA's 1990 Ski Area Master Plan Guidelines provide direction on procedures for preparing master plans and associated environmental documents, and on the required contents of a ski area master plan. Topics to be addressed include physical plans of existing and proposed ski facilities, operations, mitigation for environmental problems related to existing and new facilities, and a monitoring plan. TRPA and the U.S. Forest Service, Lake Tahoe Basin Management Unit require use of the Cumulative Watershed Effects (CWE) methodology to evaluate existing watershed disturbance at ski areas and the potential impacts of new development (see Chapter 4 of this Basin Plan). Under TRPA-approved ski area master plans, new projects are expected to be phased in relation to remedial watershed restoration work. CWE methods will be used to evaluate the adequacy of specific restoration projects to reduce the risk of significant cumulative sediment loading impacts. The Ski Area Master Plan Guidelines provide further information on the CWE.

Ski areas are subject to the TRPA land use restrictions, State discharge prohibitions and exemption criteria related to land coverage and SEZ protection which are discussed elsewhere in this Chapter. One of the required exemption findings for a recreational project is that "by its very nature," it must be located on sensitive lands. The 208 Plan (Volume I, Table 16) specifies that the following activities and facilities associated with ski areas need **not**, by their very nature, be located within SEZs or on land capability class 1b lands:

"Any activity or facility which causes additional land coverage or permanent disturbance, except for stream crossings for ski runs provided no more than five percent of SEZ area in the ski area is affected by the stream crossings, and except for facilities otherwise exempt such as utilities and erosion control facilities."

The 208 Plan also specifies that the following activities and facilities associated with ski areas need not by their very nature be located on land capability class 1a, 1c, 2, or 3 lands:

"Activities or facilities such as parking areas, base lodge facilities and offices, and retail shops, unless there is no feasible nonsensitive site available, the use is a necessary part of a skiing facility, and the use is pursuant to a TRPA-approved master plan, except for facilities otherwise exempted such as utilities and erosion control facilities."

Proposals for ski resort expansion must be carefully reviewed to prevent increases in erosion and surface runoff. New road construction must be kept to an absolute minimum, and is prohibited on high erosion hazard lands or in Stream Environment Zones unless the exemption findings for public recreation projects can be made. (Modern construction techniques permit ski lift construction without road construction.) These provisions will limit the extent of disturbance of sensitive lands for the expansion of ski areas, and will thus protect water quality.

In 1980, the State Board provided the following additional direction for ski area maintenance activities:

"Ski run and trail maintenance vehicles and equipment must not be operated in a manner that disturbs the soil. Snow moving, packing, and grooming must not be conducted when the snow cover is insufficient to protect the underlying soil from disruption."

The Regional Board has adopted waste discharge requirements for all ski areas in the California portion of the Lake Tahoe Basin. These requirements address stormwater control (especially for large parking lots), and ongoing operation, maintenance, and remedial watershed restoration activities. They are periodically updated to reflect proposed new projects and activities within the ski area. Stormwater NPDES permits may be necessary for future ski area construction projects. Local governments in the Lake Tahoe Basin must address the stormwater impacts of ski facilities on private lands under their municipal stormwater NPDES permits.

Regional Board staff should continue to participate in interagency review of proposed ski area master plans, and should update waste discharge permits as necessary for new projects carried out under master plans.

Golf Courses

Many of the existing golf courses in the Lake Tahoe Basin were constructed in Stream Environment

Zones, and have thus disrupted the natural capability of these areas to provide treatment for nutrients in stormwater. Some golf courses are located within or very near the shorezone of Lake Tahoe, or in areas with high ground water tables. Proposals have been made for expansion and/or remodeling of some Tahoe Basin golf courses. General control measures for water quality problems associated with golf courses are discussed in Chapter 4 of this Basin Plan. Existing and future golf course development in the Lake Tahoe Basin requires special control measures to prevent further eutrophication of surface waters and contamination of drinking water supplies.

Waste discharge requirements issued by the Lahontan Regional Board for golf courses in the California portion of the Lake Tahoe Basin implement policies to prevent wastes, such as fertilizer nutrients, pesticides, herbicides, and products of erosion from entering surface waters of Lake Tahoe. They also require use of BMPs for control of stormwater from parking lots, rooftops, and other impervious areas, and for prevention and control of erosion problems.

Each golf course in the Tahoe Basin should follow a control plan detailing nutrient loads, pathways, and control strategies. The use of fertilizer in stream environment zones is prohibited by the 208 Plan; the use of chemicals other than fertilizer should also be prohibited in stream environment zones. The control strategies for golf courses shall include:

- strict annual, monthly, and daily fertilizer limitations;
- controlled drainage, including holding ponds where necessary;
- maintenance of drainage systems; and
- surface and ground water monitoring programs.

TRPA also considers existing golf courses high priorities for retrofitting with BMPs because of their potential for significant water quality impacts from fertilizer and runoff. It encourages the states to issue waste discharge requirements or NPDES permits for these facilities.

The 208 Plan (TRPA 1988, Vol. I, page 136) provides that golf courses in SEZs shall be encouraged to redesign layouts and modify fertilization in order to prevent the release of nutrients to adjoining ground and surface waters. The 208 Plan also recognizes the need for careful fertilizer management, particularly within SEZs and by golf courses. The expansion or redevelopment of golf courses within SEZs will be subject to the same review procedures and exemption findings required of all recreation projects under TRPA's 1987 Regional Plan. Table 5.7-3 specifically lists types of golf course facilities which "by their very nature" need **not** be sited in sensitive lands. This would preclude the adoption of TRPA or Regional Board exemption findings to permit the following on SEZ or class 1b lands:

"Facilities and activities such as greens, fairways, and driving ranges, which require mowing, vegetative disturbance or fertilizer; clubhouses, retail services, proshop, parking areas, offices, maintenance facilities, and accessory uses, except for facilities otherwise exempted such as pedestrian and vehicular stream crossing, utilities, and erosion control facilities."

Similar provisions, with the exception of the reference to stream crossings, would apply to golf course facilities on land capability classes 1a, 1c, 2 and 3.

Golf course remodeling projects may involve proposals for relocation of coverage or disturbance within a SEZ rather than for new SEZ disturbance. Criteria for relocation of existing coverage in SEZs are discussed in the section of this Chapter on land capability. In evaluating proposals for relocation of golf course facilities in SEZs, Regional Board staff should pay particular attention to the requirement that the relocation be for the net benefit of the SEZ.

One example of possible SEZ coverage relocation within a golf course is that of paved or compacted, "hard coverage" golf cart paths. **New** coverage for golf cart paths could probably not be approved under the SEZ exemption criteria above; however, relocation of existing paths would be permissible if relocation criteria are met. Existing unpaved golf cart paths in SEZs which meet the definition of "hard coverage" should be paved to prevent erosion.

Offroad Vehicles

Water quality impacts of offroad vehicle (ORV) use are discussed as a regionwide problem in Chapter 4

of this Basin Plan. Erosion, soil compaction and damage to vegetation from ORVs are of special concern in the Lake Tahoe Basin because of the high erodibility of many of its soils, the difficulty of revegetation, and the sensitivity of surface waters. ORV damage to SEZs disturbs their capacity to treat sediment and nutrients in stormwater. TRPA estimates that more than one third of the annual sediment load to Lake Tahoe from erosion on forest lands is directly attributable to dirt roads and jeep trails.

In addition to the summer use of wheeled ORVs, snowmobile use during the winter can also affect water quality. Compacted snow on heavily traveled snowmobile routes is a good thermal conductor which can cause underlying soil to freeze readily. Rapid soil freezing and thawing loosens the soil surface and can dislodge small plants, contributing to the risk of erosion upon snowmelt.

The State Board's *Lake Tahoe Basin Water Quality Plan* provides additional information on ORV impacts.

Control Measures for ORVs

Offroad vehicle use in the Lake Tahoe Basin must be restricted to designated areas where high erosion hazard lands, stream environment zones, and sensitive vegetation are not threatened.

The 208 Plan, (Vol. I, page 151) provides that offroad vehicle use is prohibited in the Tahoe Region except on specified roads, trails, or designated areas where the impacts can be mitigated. This policy prohibits the use of motorized vehicles in areas other than those designated. Areas for this form of recreation shall be determined by TRPA in cooperation with ORV clubs, the USFS, and state and local governments. Continued use of designated areas will depend on compliance with this policy and the ability to mitigate impacts. Owners or operators of lands with existing ORV roads and trials which are not in compliance with the BMP Handbook shall be required to apply BMPs as a condition of approval for any project, and to schedule retrofit of BMPs.

The 208 Plan also includes specific guidance on types of public outdoor recreation facilities which need not, by their very nature, be located on sensitive lands, and which therefore are not eligible for exemptions from TRPA land use restrictions and California discharge prohibitions (Table 5.7-3). For ORV courses, this guidance states that the following types of facilities need not, by their very nature, be sited in SEZs and Class 1b lands:

"Facilities and activities such as ORV trails, staging areas, parking areas, maintenance facilities, and first aid stations, except for bridged stream crossings, and facilities otherwise exempted such as erosion control facilities."

The guidance includes a similar statement which would preclude exemptions for the facilities and activities mentioned above in relation to Class 1a, 1c, 2, and 3 lands "unless the ORV course is pursuant to a comprehensive TRPA-approved ORV management plan for resolving resource management problems associated with ORV activity."

The USFS Lake Tahoe Basin Management Unit adopted an ORV management plan in 1976, and is in the process of updating it. This plan also restricts ORV use to designated roads and trails. The current plan should be strictly enforced, and Regional Board staff should continue to work with the USFS and TRPA to ensure that the updated plan provides at least the same level of water quality protection.

To ensure that vehicles stay out of areas where ORV use is not permitted, some old roads must be closed or blocked off. The USFS is conducting a program of blockading roads and trails used in violation of its offroad vehicle plan. National Forest areas damaged by ORV use will be restored and revegetated as part of the ongoing USFS watershed restoration program. As noted above, the 208 Plan allows limited opportunities for relocation of offroad vehicle trails and facilities (to high-rated lands) if this is done under an approved USFS plan.

To the extent that ORV use in the Lake Tahoe Basin is confined to existing dirt roads, the water quality impacts can generally be contained by the application of standard BMPs for erosion and runoff control. However, if the ORV use damages the control devices (e.g., water bars) or aggravates erosion of the road surface, additional controls may be necessary. Following its 1991-92 review of the attainment of regional environmental threshold carrying capacity standards, TRPA identified needs for additional dust control to prevent air quality

problems, which could lead to more stringent controls on ORV use.

The current relatively low-intensity, dispersed snowmobile use in the Lake Tahoe Basin limits the severity of snow compaction problems. If snowmobiles are driven on adequate snow cover and in designated areas outside fragile locations, the water quality impacts can be minimized.

More vigorous enforcement of local and regional ordinances to control ORV use on private lands is necessary. Private landowners need to post land so that local law enforcement officials can enforce offroad vehicle restrictions.

Direct Regional Board enforcement of state water quality laws against offroad vehicle users would not be very effective. The Regional Board can issue waste discharge permits to operators of commercial ORV facilities (e.g., snowmobile courses) to prevent and control water quality problems. In some cases, waste discharge requirements and cleanup orders may be issued to property owners requiring them to prevent or correct water quality problems caused by offroad vehicle use on their property.

Recently enacted legislation directs the Regional Board to conduct a study of ORV impacts in the Lake Tahoe Basin once funding is made available.

Boating and Shorezone Recreation

The “Shorezone Protection” section of this Chapter (see Section 5.7) summarizes water quality problems related to shorezone development, TRPA's general shorezone protection programs, and guidelines for Regional Board use in evaluation of shorezone projects. Chapter 4 of this Basin Plan includes a general discussion of water quality problems and control measures related to boating and shorezone recreation activities. Problems include wastewater disposal from boats, fuel spills from boats and marinas, marina stormwater pollutants, and resuspension of sediment and associated pollutants through dredging and underwater construction. These problems are of special concern in the Lake Tahoe Basin because of the sensitivity of the Lake and the heavy recreational use it receives. The following is a summary of special control measures by problem type.

Vessel Wastes

The discharge of vessel wastes to Lake Tahoe is prohibited, but violations still occur. Boat launching facilities, piers, and buoys around Lake Tahoe have a maximum theoretical capacity (as of 1988) of about 6000 boats at one time. Many of the boats in use have built-in toilets and holding tanks or portable toilets, creating a large potential for intentional or unintentional dumping of wastewater into Lake Tahoe. Many boats are not equipped with self-contained heads, and there is no inspection program. Discharge of vessel toilet wastes introduces pollution which can affect domestic wastewater intakes from Lake Tahoe and other lakes such as Fallen Leaf and Echo Lakes. Although not in themselves a serious threat to the clarity of Lake Tahoe, vessel wastes contribute cumulatively to nutrient loading and present a public health risk.

In California, the Harbors and Navigation Code authorizes the State Board to require marinas or other marine terminals to install pumpout facilities. The State Board has adopted procedures by which the Regional Boards can determine the need for pumpout facilities, and request the State Board to require specific terminals to install them. Under these provisions, the Lahontan Regional Board shall continue to determine the need for additional pumpout facilities at Lake Tahoe, and request the State Board to require installation where such facilities are necessary. The Regional Board currently requires that all public marinas on the California side of Lake Tahoe have pumpout facilities available.

The U.S. Coast Guard is primarily responsible for enforcing prohibitions against vessel waste discharges to Lake Tahoe, and should include an inspection program as part of its enforcement effort. Other federal and state agencies should assist the Coast Guard. Permits issued by the U.S. Army Corps of Engineers, state lands agencies, and TRPA for marinas, buoys, and other facilities serving vessels on Lake Tahoe should require compliance with the prohibitions against discharge of vessel wastes. These agencies should also assist in the inspection program. The Regional Board shall assist the Coast Guard in the program to enforce the discharge prohibitions and shall bring its own enforcement actions where necessary.

The Regional Board has adopted waste discharge requirements for existing marinas at Lake Tahoe which include provisions for vessel waste pumpout facilities, and should continue to adopt waste discharge requirements for new and expanded marinas.

The 208 Plan (Vol. I, pages 104 and 157) provides that liquid and solid wastes from boats shall be discharged at approved pumpout facilities and other relevant facilities in accordance with the BMP Handbook. The 208 Plan, and TRPA's Code of Ordinances (Chapter 54) require that pumpout facilities for boat sewage shall be provided at all new and expanded commercial marinas, harbors, launching facilities and other relevant facilities, and may be required by TRPA at other existing marinas as conditions of project approval. The BMP Handbook (208 Plan, Vol. II) lists pumpout facilities as a BMP for marinas and related facilities.

Following adoption of the 1988 208 Plan, TRPA initiated a program coordinated with the Lahontan Regional Board, the Nevada Division of Environmental Protection, local governments, and the sewage collection and treatment facilities, to obtain prompt compliance with the BMP calling for pumpout facilities at marinas.

Piers

In recognition of the potential adverse impacts of continued proliferation of piers and other mooring structures in Lake Tahoe, the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Game (DFG), and the Nevada Department of Wildlife have adopted policies recommending strongly against the approval of new facilities within sensitive fish habitat (USFWS 1979 & 1980, DFG 1978). See Figure 5.8-1.

The 208 Plan (Vol. I, page 348) recognizes that the policy of the DFG is to recommend against approval of any private pier and buoy projects proposed in prime fish habitat areas, and to recommend against any proposed development that will have an adverse impact on a marsh. The policies of other federal and state agencies also protect prime fish habitat, significant fish spawning areas, biologically important stream inlets, and marsh or riparian habitats from the impacts of construction of public and private docking facilities.

Piers and jetties should not be allowed to block currents. They must be constructed so as to allow current to pass through. Pier construction must be prohibited in significant spawning habitat. Pier construction should also be prohibited in waters in or immediately offshore of biologically important stream inlets. Pier construction must be discouraged in prime fish habitat areas. Further study of the effects of piers should be continued. The controls called for here may be modified, or additional controls required, based on the findings of that study.

In 1980, the State Board adopted the following prohibition against new pier construction in significant spawning habitat or offshore of biologically important stream inlets:

"The discharge or threatened discharge, attributable to new pier construction, of solid or liquid wastes, including soil, silt, sand, clay, rock, metal, plastic, or other organic, mineral or earthen materials, to significant spawning habitats or to areas immediately offshore of important stream inlets in Lake Tahoe is prohibited."

The prohibition against discharges immediately offshore of important stream inlets shall apply up to a thirty-foot contour. Discharges to the inlets themselves are subject to the prohibition against discharges to Stream Environment Zones.

The determination whether an area is significant spawning habitat or an important stream inlet shall be made on a case-by-case basis by permitting agencies, in consultation with the USFWS and state fish and wildlife agencies. Maps which have been produced by these agencies may be used as a guide. Because of the scale on which the maps have been produced, however, and the possibility that additional information may become available, the maps will not necessarily be determinative. [TRPA has adopted fish habitat maps for Lake Tahoe which differ somewhat from those prepared by the fish and wildlife agencies, and has designated additional important stream inlets by ordinance.]

The term "pier," as used in the prohibition above, includes any fixed or floating platform extending from the shoreline over or upon the water. The term includes docks and boathouses. The prohibition does not apply to maintenance, repair, or replacement of

piers at the same site. The prohibition shall also be subject to the exceptions which apply to the prohibitions setting restrictions on development. (See the sections of this Chapter on development restrictions and shorezone protection for information on exemption criteria.)

Under Section 401 of the federal Clean Water Act, the U.S. Army Corps of Engineers cannot issue any permit if the state water quality agency denies certification that the permitted discharge is in compliance with the applicable state water quality standards (see the separate section of this Chapter on 401 and 404 permits). The prohibitions in this plan are part of California's water quality standards for Lake Tahoe, effectively precluding the Corps of Engineers from issuing permits for pier construction in violation of the prohibitions.

This plan does not prohibit the use of mooring buoys, which are now used as alternatives to piers in many cases, although the USFWS (1979) has recommended against their approval in sensitive fish habitat because of the adverse effects of powerboat use.

Permitting agencies should also discourage construction of new piers in prime fish and aquatic habitat, emphasizing alternatives such as use of existing facilities. These permitting agencies include the Corps of Engineers, state lands agencies, the Tahoe Regional Planning Agency, and the Lahontan Regional Board. Where permits for pier construction are issued, they should require construction practices to contain any sediment disturbed by placing structures in Lake Tahoe. When piers or other structures are placed in Lake Tahoe, they should be surrounded by vertical barriers to contain any disturbed sediment. The permits should also prohibit any construction which will alter the flow of currents in Lake Tahoe. If necessary, the Lahontan Regional Board shall issue permits to require compliance with practices to prevent water quality problems from construction of piers and other shorezone structures. In addition to the special considerations above, such permits should reflect the regionwide criteria for piers and shorezone construction in Chapter 4 of this Basin Plan.

In reviewing pier projects, the California State Lands Commission generally requires that construction be done from small boats, and that construction wastes be collected on these vessels or on tarps and disposed of properly. The State Lands Commission also implements a special plan for protection of the endangered shorezone plant, Tahoe yellow cress. Pier construction, and other underwater/shorezone construction activities, are subject to all applicable water quality standards, including the nondegradation objectives contained in this Basin Plan.

The 208 Plan (TRPA 1988, Vol. I) provides for regulation of piers as part of TRPA's larger shorezone and fish habitat protection programs. The 208 Plan states that TRPA shall regulate the placement of new piers, buoys, and other structures in the foreshore and nearshore to avoid degradation of fish habitat, interference with littoral drift, and other concerns. TRPA shall regulate the maintenance, repair, and modification of piers and other structures in the nearshore and foreshore. TRPA has sponsored a university study of the impacts of piers on fish habitat, and may propose changes in its regional land use plan based on the results.

Dredging

Chapter 4 of this Basin Plan includes additional discussion of water quality problems related to dredging, and regionwide dredging guidelines. Construction (e.g., of piers) and dredging in Lake Tahoe can cause localized pollution problems, by disturbing sediments: this increases turbidity and reintroduces nutrients which had settled out of the water. The sediments may also be redeposited elsewhere. Construction in Lake Tahoe may also affect current flow, causing currents to disturb bottom sediments. If disposal of dredged material is done improperly, nutrients from these wastes could cause water quality problems. Dredging and disposal of marina sediments are of special concern because very high levels of tributyltin (an antifouling ingredient of boat paint) have been detected in sediments and biota of one Lake Tahoe marina.

The 208 Plan (Vol. I, page 105) states that construction and dredging in Lake Tahoe are potential sources of sediment and nutrients which could threaten fish habitat due to excessive turbidity, sedimentation of feeding and spawning grounds, or substrate alteration. Water quality problems may result from resuspension of sediment and nutrients on the lake bottom or in backshore lagoons and marinas. These impacts vary depending upon the

type of construction or dredging used. Suction dredging generally resuspends less sediment than clamshell dredging and construction of open piling piers resuspends less sediment than construction of sheet piling structures.

Water quality certification for U.S. Army Corps of Engineers nationwide Section 404 permits for "headwater" dredge and fill activities has been denied for the Lake Tahoe Basin by the State of California. Therefore, any dredging and filling in the Lake Tahoe Basin requires an individual Corps of Engineers permit, which must itself receive state certification.

Methods of dredging which stir up bottom sediments, as when backhoes or drag lines are used, should not be permitted. Under most circumstances, only suction dredging should be allowed. However, even with turbidity barriers, suction dredging followed by interim storage of dredged material in an "inner harbor" situation may create more problems than bucket dredging. Localized problems related to turbidity may result from repeated disturbance of stored dredged material for final disposal. Regional Board staff should evaluate proposed dredging methods based on site-specific circumstances and require the method which results in the lowest degree of threat to water quality. Disposal of dredged materials must follow practices to prevent sediments from being discharged into Lake Tahoe. The Best Management Practices Handbook (TRPA 1988, Volume II) includes BMPs for the dredging process and for disposal of dredged material. Consideration should be given to the use of dredged material in reclamation of abandoned mines, quarries, and borrow pits outside of the Tahoe Basin.

The Lahontan Regional Board should review all proposed dredging in the Lake Tahoe Basin and should not permit the dredging unless the practices called for in this plan are followed.

The 208 Plan includes the following provisions related to dredging of Lake Tahoe and other lakes within TRPA's jurisdiction (TRPA 1988, Vol. I, pages 158-59):

"Filling and dredging in the lakes of the region are permissible activities, but are subject to ordinance provisions to protect water quality and the natural functions and dynamics of the shore lines and lake beds. TRPA shall apply state and TRPA water quality thresholds, standards, and guidelines to activities which involve construction within Lake Tahoe. Where turbidity curtains are used to prevent the mixing of turbid waters near the construction site with clear lake waters, TRPA shall apply and enforce the Uniform Runoff Guidelines for discharge of surface runoff to surface waters at the point or points of discharge from the turbidity curtain. Ambient water quality thresholds and standards applicable in the littoral zone shall be applied and enforced at a reasonable distance from the construction activity. Filling is limited to dredging, shore line protective measures, beach replenishment, or other activities that can be found to be beneficial to existing shorezone conditions or water quality and clarity."

The "Uniform Runoff Guidelines" cited above are the 1980 California stormwater effluent limitations; a revised version of these limitations is contained in Table 5.6-1 of this Basin Plan.

Dredging and filling activities are subject to the Regional Board discharge prohibitions and exemption criteria discussed elsewhere in this Chapter.

Dredged material may be disposed of inside or outside of the Lake Tahoe Basin, but the Regional Board will set effluent limitations based on the numbers in Table 5.6-1 and on appropriate receiving water standards. Proposals for dredged material disposal in shorezones, floodplains or SEZs will be evaluated against the relevant discharge prohibitions (see the section of this Chapter on development restrictions).

TRPA's regulations on dredging techniques and discharge standards are set forth in the BMP Handbook (208 Plan, Vol. II). The 208 Plan directs TRPA, in coordination with other agencies such as the Lahontan Regional Board, the Nevada Division of Environmental Protection, the U.S. Army Corps of Engineers, state fish and game agencies, and state lands agencies, to recognize potential water quality impacts from spoils disposal, as well as from dredging itself, in its permitting process for filling and dredging activities.

Marinas

The Lahontan Regional Board has maintenance waste discharge requirements on all marinas in the

California portion of the Lake Tahoe Basin which address stormwater discharges, fueling and sewage disposal operations. New or revised requirements should be adopted to address any new marina construction activity or changes in the nature of discharges or threatened discharges from existing marinas. A detailed discussion of water quality problems and control measures associated with marina discharges is provided in a regionwide context in Chapter 4 of this Basin Plan. As noted in that Chapter, some marinas may require stormwater NPDES permits.

TRPA regulates the creation, expansion, and remodeling of marinas in the Lake Tahoe Basin through its Regional Plan limits on recreation capacity (in "People at One Time," or PAOT) and through its master planning and permitting processes. Following a lengthy interagency review period, which included Regional Board staff input, TRPA adopted detailed guidelines for the preparation of marina master plans (TRPA 1990). These guidelines require each master plan to include a physical plan, an operations plan, a mitigation plan, and a monitoring plan. Water quality-related topics to be addressed include land coverage, fish habitat, shoreline stability, inspection and maintenance of boat washing and fueling facilities, wastewater pumpout facilities, stormwater control, spill prevention and response, dredging, and marina water treatment systems. The guidelines also summarize shorezone development standards for new and expanded marinas from TRPA's Code of Ordinances, and provide guidance on the design of breakwaters, jetties, and shoreline protection structures.

Although conceptual proposals have been made for marina water treatment systems, none are currently operating in the Lake Tahoe Basin (the Tahoe Keys Property Owners Association operates a chemical/physical treatment plant which provides phosphorus removal for the waters of its artificial lagoons). TRPA's guidelines state that, in the broad sense, "any treatment which is employed to improve and maintain water quality would be a component of the water treatment system." Possible treatment methods discussed include artificial circulation and aeration, pretreatment of stormwater discharges, and interception of stormwater constituents from driveways, launching ramps, and boat washing facilities by slotted drains directed into sumps which can be pumped and possibly equipped with absorbent material. If tributyltin is found to be a problem, marina sediments containing it may have to be removed.

The TRPA guidelines state that commercial marinas and harbors are required to have public restrooms, fueling facilities, chemical fire retardant distribution systems, and pumpout facilities for boat sewage. Disposal facilities for portable sewage containers should also be provided. Prevention of boat sewage waste pollution will be in accordance with an enforcement program to be developed by the Marina Owners Association and approved by TRPA. Boat washing facilities, if any, must be connected to a sewer system or an acceptable alternative such as a debris trap and sump which will be emptied regularly. Connections to sewer systems may require special arrangements with the service district such as permits, pretreatment of discharges, and fees for service. Gas pumping facilities are required to have emergency and standard shut-off systems. A water treatment system for waters contained within the marina must be provided.

Fuel, sewage pumpout and portable sanitation flushing facilities at marinas need to be carefully placed. The TRPA guidelines state that they should be located in a convenient place to encourage use by all boaters (including boaters from private piers and non-commercial moorings. Emergency spill containment equipment must be at hand at such facilities, not stored ashore.

TRPA's marina master plan guidelines also provide guidance on environmental analysis, including directions for cumulative impacts analysis. In 1994, a regionwide study and environmental document were in preparation to evaluate the cumulative impacts of potential marina expansion on Lake Tahoe.

Regional Board staff should continue to participate in interagency review of proposed marina master plans and marina development projects. Proposals for "experimental" facilities such as marina water treatment systems should be carefully evaluated on a case-by-case basis.